JOURNAL
of INTERDISCIPLINARY
KNOWLEDGE

DOI: https://doi.org/10.37497/jik.v9iknowledge.1649

ARTICLE

Agenda 2030 in Times of Crisis: The Impact of the COVID-19 Pandemic on Sustainability Indicators in Brazil

Agenda 2030 em Tempos de Crise: os Reflexos da Pandemia da Covid-19 nos Indicadores de Sustentabilidade no Brasil

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ABSTRACT | **Purpose:** To analyze the impacts of the Covid-19 pandemic on sustainability indicators associated with the Sustainable Development Goals (SDGs) in Brazil from 2019 to 2023. **Methodology/Approach:** This study adopts a bibliographic and documentary approach, with an exploratory and descriptive design, based on reports from national and international organizations (UN, UNDP, IBGE, IPEA, WHO, ILO, and FAO). Social, environmental, and economic indicators were selected to assess setbacks, progress, and temporary impacts. **Findings:** Results reveal heterogeneous effects. Progress was observed in indicators such as renewable energy (SDG 7), innovation and infrastructure (SDG 9), and internet access (SDG 17). Conversely, setbacks occurred in gender equality (SDG 5), income inequality (SDG 10), and deforestation (SDG 15). Some impacts were temporary, such as Covid-19 mortality (SDG 3) and education (SDG 4). Other indicators, such as sanitation and governance, remained relatively stable. **Originality/Value:** The study provides an integrated assessment of pandemic impacts on SDGs in Brazil, highlighting interdependencies among social, economic, and environmental dimensions. **Implications:** Findings emphasize the need for integrated public policies to accelerate the 2030 Agenda, particularly in addressing structural inequalities.

Keywords | 2030 Agenda; SDGs; Covid-19; Sustainability Indicators; Public Policies.

Received: 05 December 2025
Revised: 23 March 2026
Accepted: 23 April 2026
e-ISSN: 3086-0016

Associate editor: Altieres Silva – Alumni.In Publisher

How to cite this article: Santos Silva, M. C. R. dos, Dias Porto, C. G., de Arruda Neto, J. F., Silva de Aragão, J. V., Onofre de Farias, W. S., & Lima da Silva, G. (2026). Agenda 2030 in Times of Crisis: The Impact of the COVID-19 Pandemic on Sustainability Indicators in Brazil. *Journal of Interdisciplinary Knowledge, 9*(knowledge), e01649. https://doi.org/10.37497/jik.v9iknowledge.1649

RESUMO | **Objetivo:** Analisar os reflexos da pandemia da Covid-19 sobre indicadores de sustentabilidade associados aos Objetivos de Desenvolvimento Sustentável (ODS) no Brasil, no período de 2019 a 2023. **Metodologia/Abordagem:** A pesquisa é bibliográfica e documental, de caráter exploratório e descritivo, baseada em relatórios de organismos nacionais e internacionais (ONU, PNUD, IBGE, IPEA, OMS, OIT e FAO). Foram selecionados indicadores sociais, ambientais e econômicos para avaliar retrocessos, avanços e impactos temporários. **Resultados:** Os resultados evidenciam efeitos heterogêneos. Houve avanços em indicadores como energia renovável (ODS 7), inovação e infraestrutura (ODS 9) e acesso à internet (ODS 17). Em contrapartida, observaram-se retrocessos em igualdade de gênero (ODS 5), desigualdade de renda (ODS 10) e desmatamento (ODS 15). Alguns impactos foram temporários, como mortalidade por Covid-19 (ODS 3) e educação (ODS 4). Indicadores como saneamento e governança permaneceram relativamente estáveis. **Originalidade/Valor:** O estudo oferece uma análise integrada dos impactos da pandemia nos ODS no Brasil, evidenciando interdependências entre dimensões sociais, econômicas e ambientais. **Implicações:** Os achados reforçam a necessidade de políticas públicas integradas para acelerar a implementação da Agenda 2030, especialmente no enfrentamento das desigualdades estruturais.

Palavras-chave | Agenda 2030; ODS; Covid-19; Indicadores de Sustentabilidade; Políticas Públicas.

1 INTRODUCTION

The 2030 Agenda, launched by the United Nations (UN) in 2015, represents one of the most ambitious global commitments ever made to address socio-environmental challenges. of century XXI. Structured in 17 Objectives of Development Sustainable (SDGs) and 169 goals, she search promote until 2030 a eradication of extreme poverty, the Reducing inequalities, protecting the environment, and building more just, inclusive, and resilient societies (Barbiere, 2020). However, just a few years after its adoption, the world was surprised by one of the greatest contemporary crisis events: the Covid-19 pandemic.

The crisis sanitary global, declared for the Organization World from the Health (WHO) in March 2020 brought devastating consequences for health systems, the global economy, and social dynamics. Internationally, there was an increase in poverty and food insecurity, setbacks in education due to the suspension of in-person school activities, a rise in unemployment, and an intensification of gender and racial inequalities. In Brazil, the impacts were even more visible due to historical structural inequalities, highlighting vulnerabilities that hinder the achievement of the goals of the 2030 Agenda (Brito, 2022).

In this context, the pandemic acted as a true "stress test" for the SDGs. While revealing deep weaknesses, it also provided lessons and opened up space. to advances punctual, as the acceleration from the digitization, the innovation node sector from the health and the strengthening of networks of solidarity social (Elijah, 2020). Like this, to analyze you Understanding sustainability indicators affected by the pandemic is essential to grasping whether the world, and in particular the Brazil, this more next or more distant of to reach to the goals proposals (Ventura *et al.,* 2020).

The relevance this study, therefore, this in identify you effects from the pandemic from the This study analyzes the impact of Covid-19 on several indicators related to the 2030 Agenda, offering a critical view of the setbacks and potential progress made during this period. It also assesses the impact on key indicators. axes from the sustainability, social, economic and environmental, is sought to supply subsidies that contribute both to the reflection academic as to the formulation of policies more effective public policies.

Given this scenario, the general objective of this article is to analyze the impact of the Covid-19 pandemic on some sustainability indicators associated with the SDGs. Specifically, it aims to: (i) identify which indicators suffered the greatest setbacks during the pandemic; (ii) point out any advances generated by the crisis period, such as the strengthening from the digitization and from the innovation in health; and (iii) relate you learnings from the pandemic with need of accelerate implementation from the Agenda 2030 node Brazil and in the world.

Therefore, the analysis proposal not only contributes to the academic debate, but It also reinforces the urgency of mobilizing around the 2030 Agenda, especially in the post-pandemic period, in which the challenges become more complex and the time to meet the goals is increasingly reduced.

2 BASIS THEORETICAL

The 2030 Agenda represents one of the most comprehensive initiatives ever approved in the field of development sustainable. Your originality this in nature universal (applies) the all countries, independently of your level of development) and integrated, to the to recognize that challenges social, economic and environmental no they can to be faced in isolation (Serafini, 2022). The 17 SDGs form a normative and strategic framework that requires cooperation between governments, the private sector, academia, and civil society (Gonçalves *et al.*, 2024).

According to Garcia-Rodriguez *et al.* (2024), the SDGs differ from the Sustainable Development Goals. of Millennium (ODM) to the incorporate one vision systemic: the poverty no he can to be overcome without advances in areas as equality of gender, transition energy, governance democratic and preservation of biodiversity. That interconnection strengthens the notion of what each The goal is linked to the too much, and what advances partials in one objective they can to be cancelled put setbacks elsewhere.

To in addition of your character normative, the Agenda 2030 also he has one dimension Politics. It serves as a reference point for aligning national commitments with global parameters, creating mechanisms for accountability *and* transparency. In this sense, the voluntary national reports, submitted periodically by countries to the UN, have been fundamental. to monitor the engagement and you results achieved (Raasch, Lelis and Basso, 2023).

THE monitoring from the Agenda 2030 It depends. of indicators what translate goals in measurable data. As point Zorzo *et al.* (2022) and Arpinia *et al.* (2023), indicators of sustainability no they are just numbers: they constitute "shortcuts" cognitive what condense complex phenomena and offer objective bases for decision-making.

According to Sá (2023), there is a consensus in the literature that indicators must meet some fundamental requirements: Relevance to reflect essential aspects for social, economic and environmental well-being; Comparability to allow analyses in different periods. of time and contexts geographical; and Accessibility to to be understandable and transparent to different audiences (governments, civil society, researchers).

The SDG indicators play a particularly challenging role. As Rodrigues (2021) observes, the big number of goals and indicators he can to generate risks of fragmentation and technocratization

of debate. Put other side, your diversity and necessary to capture the complexity of national and local realities.

In Brazil, institutions such as the Brazilian Institute of Geography and Statistics (IBGE), the Institute for Applied Economic Research (IPEA), and the Brazilian SDG Network have contributed to adapting you indicators global to the context national, considering specifics social and regional. That process and crucial, then the mere transposition of metrics global he can to make local inequalities invisible (IPEA, 2018).

THE pandemic of Covid-19 he was one phenomenon Restroom what quickly if transformed in crisis multidimensional. More of what one event of health public, she revealed interdependencies between economy, quite environment and relations social. As highlight the Commission Economic for Latin America and the Caribbean (ECLAC, 2020) and the United Nations Development Programme (UNDP, 2021), you impacts from the pandemic no if they distributed of form homogeneous: it hit vulnerable populations, informal workers, women and children hardest .

From point of view economic, the Organization International of Work (ILO, 2021) es estimau what about of 255 millions of jobs equivalents the time integral they were lost in 2020, configuring the bigger crisis work since the Great Depression. Node field educational, UNESCO (2021) reported what more of 1.6 billion of students they had your classes Interrupted at some point, creating learning gaps that tend to last for generations.

Yet what you have had reductions temporary in indicators environmental, as emissions CO_2 during you periods of *lockdown* several studies point what such effects they were cyclical and no changed the trend structural of worsening from the crisis climate. That reinforces thesis of what the sustainability no he can to be achieved put strikes emergencies, but yes why transformations structural in the forms of production and consumption (IEA, 2021; UNEP, (2022). In this sense, the pandemic should be understood as a historical landmark that exposed weaknesses in global and national systems, highlighting the need to strengthen integrated policies aligned with the SDGs. As Guterres (2021), Secretary-General of the UN, the crisis sanitary "no just delayed progress, but also tested the resilience of the Agenda 2030 like a compass to a future more sustainable.

3 METHODOLOGY

This study is characterized as bibliographic and documentary research, of a nature... exploratory and descriptive, turned to to analyze you reflexes from the pandemic of Covid-19 in some of the sustainability indicators associated with the SDGs in Brazil. The methodology was structured in four main stages, as illustrated in the flowchart presented in Figure 1.

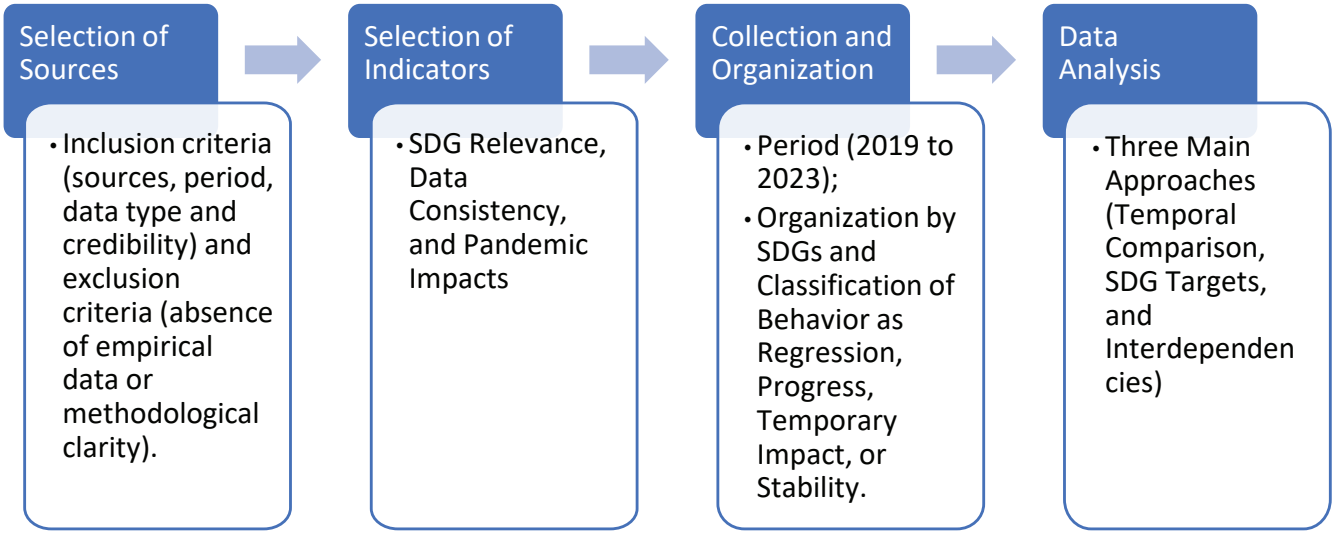

Figure 1. Flowchart Methodological

Source: Authors, 2025.

In the first stage, a careful selection of bibliographic and documentary sources was carried out. prioritizing reports international and national recognized as reference node Monitoring the 2030 Agenda, including the UN and the United Nations Development Programme. (UNDP), CEPAL, IBGE, IPEA, WHO, *International Energy Agency* (IEA), the International Labour Organization (ILO), the Food and Agriculture Organization of the United Nations Agriculture (FAO). You criteria of inclusion covered publications between 2018 and 2023 including pre-pandemic, crisis, and post-pandemic data; availability of information. numerical or qualitative on indicators of sustainability; credibility from the The institution responsible; and its applicability to the Brazilian or international context with comparative relevance. They were excluded sources without data empirical verifiable or with methodology unclear .

THE second stage involved the selection of the indicators used node study, aiming represent of form synthetic and balanced you different impacts from the pandemic us SDGs node Brazil. A choice considered three criteria Key points: relevance theme in relationship to the SDGs, availability of consistent data for the period from 2019 to 2023 and the ability to reflect setbacks, advances or impacts temporary associates to the context pandemic. They were Prioritized social indicators that highlight challenges and inequalities intensified by the crisis period; environmental indicators that allow for the assessment of momentary effects or structural setbacks; and indicators economic what reflect oscillations in income, innovation and patterns of Consumption, as shown in Table 1.

Table 1. Selection of Indicators

Axles	SDGs	Indicator
Social	SDGs 1 – Eradication of poverty	Percentage of the population below the poverty line
	SDGs 2 – Hunger zero and agriculture sustainable	Prevalence of food insecurity
	SDGs 3 – Health and well- being	Rate of mortality due to Covid- 19
	SDGs 4 – Education quality	Rate Liquid of Registration node Teaching Fundamental in Brazil
	SDGs 5 – Equality of gender	Participation female in the market work
	SDGs 10 – Reduction of inequalities	Index of Gini
	SDGs 11 - Sustainable cities	Population living in settlements precarious
	SDGs 16 Peace, justice and institutions effective	Rate of homicides
Environmental	SDGs 6 – Water drinkable and sanitation	Access the water drinkable and sewage system
	SDGs 13 – Action against the change global of the climate	Emissions of CO_2 per capital
	SDGs 14 – Life in water	Conservation navy
	SDGs 15 – Life terrestrial	Rate of annual deforestation
Economic	SDGs 7 – Energy clean and accessible	Participation of renewable of electrical matrix
	SDG 8 – Decent work and economic growth	Rate of unemployment; GDP per capita
	SDGs 9 – Industry, innovation and infrastructure	Investments in R&D; access to Internet
	SDGs 12 – Consumption and responsible production	Generation of waste solids urban
	SDGs 17 – Partnerships and means of implementation	Access the Internet us municipalities

Source: Authors, 2025.

The third stage consisted of collecting and organizing data related to the selected indicators, covering the period from 2019 (pre-pandemic) to 2023 (post-pandemic). The data were classified according to the corresponding SDGs, allowing the identification of: setbacks, when there was consistent or temporary worsening; advances, when there was significant improvement; and impacts. temporary, characterized put changes punctual with return to the levels previous; and stability, when you indicators remained relatively constants. They were registered values absolutes, percentages and metrics standardized, guaranteeing the comparability between periods.

In the fourth stage, the data were subjected to critical and comparative analysis, integrating three approaches main points: (i) comparison temporal **,** evaluating the behavior of the indicators before, during and after pandemic; (ii) analysis (i) the SDG targets **,** comparing the indicators with the targets set out in the 2030 Agenda; and (ii) interdependencies between indicators, identifying relationships between setbacks, progress and stability in the social, economic and environmental dimensions. THE analysis considered also limitations and biases potential, as disagreements Methodological differences between institutions, possible underreporting of social and health data, and temporary conjunctural effects on environmental indicators.

The method adopted allowed not only for the quantitative recording of changes in indicators, but also for a critical interpretation of the weaknesses and opportunities revealed. because of the pandemic, offering subsidies to policies public and actions social aimed at accelerating the implementation of the 2030 Agenda in Brazil.

4 RESULTS

THE analysis of the indicators of sustainability related at 17 SDGs evidence you multidimensional impacts during the Covid-19 pandemic in Brazil, allowing To identify setbacks, temporary advances, and recovery trends. The data presented in Table 2 were extracted from reliable sources such as IBGE, UNDP, ILO, FAO, and WHO, covering the period from 2019 to 2023.

Table 2. Impacts from the Pandemic us Indicators Selected of the SDGs node Brazil (2019-2023).

SDGs	Indicator	Goal SDGs	2019	2020	2021	2022	2023	Type of Impact
1	Proportion of the population in situation of extreme poverty	Eradicate poverty ex trema	6.5%	9.0%	9.0%	5.9%	4.4%	Recovery
2	Prevalence of food insecurity	Eradicate hunger	33.2 millions	33.2 millions	33.2 millions	33.2 millions	24.4 millions	Progress
3	Rate of COVID-19 mortality	Reduce mortality	0.0%	1.2%	1.0%	0.8%	0.6%	Impact Temporary
4	Net Tuition Fee node Teaching Fundamental in Brazil	To guarantee inclusive education	92%	91.5%	91%	92.5%	93%	Impact Temporary / Recovery
5	Participation women in the labor market	Equality of gender	45%	42%	43%	44%	45%	Setback/ Recovery
6	Access the water drinking water and sewage disposal	Guarantee water clean	84.1%	84.2%	84.2%	84.2%	84.2%	Stable
7	Participation of renewables in headquarters electric	Guaranteeing clean energy	45%	46%	47%	48%	49%	Progress
8	Rate of Unemployment; GDP per capita	Promote decent work	11.9%	13.5%	13.2%	11.9%	6.6%	Setback/ Recovery
9	Investments in R&D; access the Internet	Build in infrastructure	1.2% of GDP	1.1% of GDP	1.3% of GDP	1.4% of GDP	1.5% of GDP	Progress
10	Index of Gini (income inequality)	Reduce inequalities	0.53	0.54	0.53	0.52	0.51	Regression
11	Percentage of the population urban with access to public transport	To become inclusive cities	60%	58%	59%	60%	61%	Stable
12	Percentage of recycled solid waste	Production and consumption responsible	3%	3.5%	4%	4.5%	5%	Progress
13	Emissions of CO_2 per capita	Combating climate change	10.5 t	9.8 t	10.0 t	10.2 t	10.3 t	Temporary
14	Percentage of marine areas protected	Marine conservation	25%	26%	27%	28%	29%	Progress
15	Rate of annual deforestation	Protecting terrestrial ecosystems	7,000 km²	8,000 km²	7,500 km²	7,200 km²	7,000 km²	Regression
16	Index of perception of corruption	Promoting effective institutions	37	35	36	37	38	Stable
17	Percentage of municipalities with internet access	Strengthen partnerships	70%	72%	74%	76%	78%	Progress

Source: Adapted of IBGE (2024), UNDP (2024), ILO (2023), FAO (2025) and WHO (2024).

The data in Table 2 show that the Covid-19 pandemic generated differentiated effects. in the dimensions social, economic and environmental. Some indicators they suffered setbacks Significant impacts, especially at the beginning of the crisis, while others maintained upward or stable trends. Certain impacts were temporary, reflecting cyclical changes that adjusted in subsequent years. This diversity of effects reinforces the complexity. from the relationship between crises sanitary and sustainability, highlighting the need of public policies integrated what promote recovery economic, inclusion social and protection environmental .

4.1 Setbacks significant

The indicators most impacted by the pandemic These figures reveal setbacks in social, economic, and environmental dimensions. In SDG 5 (Gender Equality), female participation in the labor market fell from 45% (2019) to 42% (2020), recovering only to the initial level. in 2023 without advances structural towards the equality full. Node SDGs 8 (Work decent and growth economic), the rate of unemployment went up of 11.9% to 13.5% in In 2020, the growth rate fell to 6.6% in 2023, indicating a partial but insufficient recovery given the instability of GDP per capita. SDG 10 (Reduced Inequalities) also showed a setback: the Gini Index increased to 0.54 in 2020, slowly declining to 0.51 in 2023, still above the target. of level equitable. Already node SDGs 15 (Life terrestrial), the logging grew to 8,000 km² in 2020 returning only in 2023 to level of 2019 (7,000 km²), highlighting fragility of environmental policies.

Confronted with to the goals from the Agenda 2030, those results point delay and Insufficient progress. Gender equality (SDG 5) remains distant; the reduction of unemployment (SDG 6) 8), although positive, no guarantees growth sustained; to the inequalities (SDGs) 10) Unemployment levels remain high, and environmental conservation (SDG 15) remains vulnerable. Integrated analysis reveals interdependencies: increased unemployment exacerbated female exclusion, the rise in the Gini coefficient reinforced social inequalities, and the advance of deforestation reflected this. the fragility from the oversight in periods of crisis. Put other side, the recovery partial job and the light fall of Gini show what policies economic consistent they can to generate positive cross-cutting effects. However, isolated advances remain fragile, reinforcing the need for coordinated strategies that combine social inclusion, quality of work, and environmental preservation for greater systemic resilience.

4.2 Progress

Some indicators they presented growth node period analyzed, revealing resilience and opportunities generated for the pandemic, what contributed to advances in direction to the goals Regarding the 2030 Agenda, in SDG 2 (No Hunger), the population experiencing food insecurity fell from 33.2 million in 2019 to 24.4 million in 2023, although still far from being eradicated. total. Node SDGs 7 (Energy clean and accessible), the participation of sources renewable in the energy matrix it went from 45% to 49%, signaling continuous progress, but insufficient given from the need of accelerate the transition energetic. THE SDGs 9 (Industry, innovation and Infrastructure) saw an

increase in R&D investments (from 1.2% to 1.5% of GDP) and in digital connectivity, moving closer to the inclusive innovation goals. SDGs 12, 14, and 17 (Responsible Consumption, Marine Life, and Partnerships) advanced with growth in recycling and expansion. of areas marine protected and bigger access the Internet us municipalities, highlighting the effectiveness of public policies and collaborative arrangements.

Despite these advances, a comparison with the goals of the 2030 Agenda shows that the results... yet They are partial. A hunger persists as a challenge structural (SDG 2), a The energy transition requires more robust investments (SDG 7), innovation levels remain below global standards (SDG 9), and the long-term sustainability of environmental and cooperation actions (SDGs 12, 14 and 17) depends on greater scale and continuity.

The integrated analysis highlights interdependencies between social, economic, and environmental dimensions: the reduction of hunger is related to the strengthening of social policies and connectivity. digital (SDGs) 9 and 17); the progress of renewable connects to the consumption responsible and to conservation navy (SDGs) 12 and 14); and you progress in recycling and areas protected reinforce the importance from the cooperation International (SDGs) 17). In synthesis, although expressive, you advances remain fragile, requiring bigger integration between fight the hunger, transition Energy, technological innovation and environmental preservation to accelerate the achievement of the 2030 Agenda.

4.3 Temporary Impacts

Some social indicators were heavily impacted by the pandemic, but they showed... fast recovery, highlighting resilience of system. Node SDGs 3 (Health and well-being), The Covid-19 mortality rate reached 1.2% in 2020, decreasing to 0.6% in 2023, a result associated with mitigation measures, vaccination campaigns, and strengthening of the system. of health. Despite of this improvement, the goal of health universal remains incomplete, then The crisis exposed structural weaknesses in access to services and preparedness for health emergencies. In SDG 4 (Inclusive Education), the enrollment rate temporarily fell between 2020 and 2021 due to school closures and inequality in access to digital resources, but recovered and reached 93% in 2023 overcoming you levels pre-pandemic. Although positive, this progress does not yet eliminate regional and socioeconomic inequalities, compromising the universalization of education.

Confronting you results with to the goals from the Agenda 2030, it is observed what you Indicators show recovery, but do not guarantee full achievement of the objectives. The reduction in mortality (SDG 3) represents significant progress, but requires structural reinforcement and equity in healthcare. access; the increase from the schooling (SDGs) 4) and consistent, but limitations regional and Social vulnerabilities persist. Integrated analysis reveals interdependencies: improvements in health supported the recovery in education, while temporary setbacks in education amplified social vulnerabilities, impacting other indicators such as employment and inequality (SDGs 8 and 10). In short, the fast recovery he was made possible put policies emergencies, innovation technological and cooperation institutional, highlighting need strategies integrated what Consolidate gains and reduce structural weaknesses towards the goals of the 2030 Agenda.

4.4 Stability

Some indicators showed relative stability during the analyzed period, demonstrating resilience institutional and social, although yet distant of goals from the Agenda 2030. In SDG 6 (Clean water and sanitation), coverage remained around 84.2%, signaling stability, but remaining insufficient to to reach the universalization. THE SDGs SDG 11 (Inclusive Cities) showed slight variations, between 58% and 61%, indicating continued progress, but still falling short of ideal standards for sustainable and equitable urbanization. As for SDG 11 (Inclusive Cities), it showed slight variations, between 58% and 61%, indicating continued progress, but still falling short of ideal standards for sustainable and equitable urbanization. 16 (Institutions) effective showed little evolution node index of perception from the Corruption, ranging from 35 to 38, suggests persistent challenges in consolidating effective and transparent governance .

A comparison with the goals of the 2030 Agenda reveals that, although these indicators do not have regressed, your progress and limited, compromising the greeting integral of the objectives. Stability in water and sanitation (SDG 6) and in inclusive cities (SDG 11) demonstrates capacity institutional of maintenance of services, but indicates need of more policies ambitious to expansion and equity. THE low evolution from the governance (SDGs) 16) It reinforces that progress in other dimensions, such as health, education, and the reduction of inequalities, depends on strong and transparent institutions. The integrated analysis highlights interdependencies: governance deficits can limit investments in urban infrastructure and sanitation, while the expansion of basic services and infrastructure contributes to reducing social and environmental vulnerabilities. Thus, the observed stability is positive, but insufficient; it is necessary strengthen policies public, improve institutions and integrate actions social, economic and environmental factors to accelerate the achievement of the goals of the 2030 Agenda.

4.5 Analysis Integrated of the Impacts from the Pandemic in the Indicators Selected

THE Figure 2 it presents the graphic of bars comparing you values of 2023 with to the goals For each SDG, colors indicate the type of impact: green (progress), red (regression), orange (temporary impact), and gray (stable). Figure 3 presents the radar chart that visually shows the type of impact per SDG, allowing for quick identification of which goals suffered setbacks, progress, temporary impacts, or remained stable.

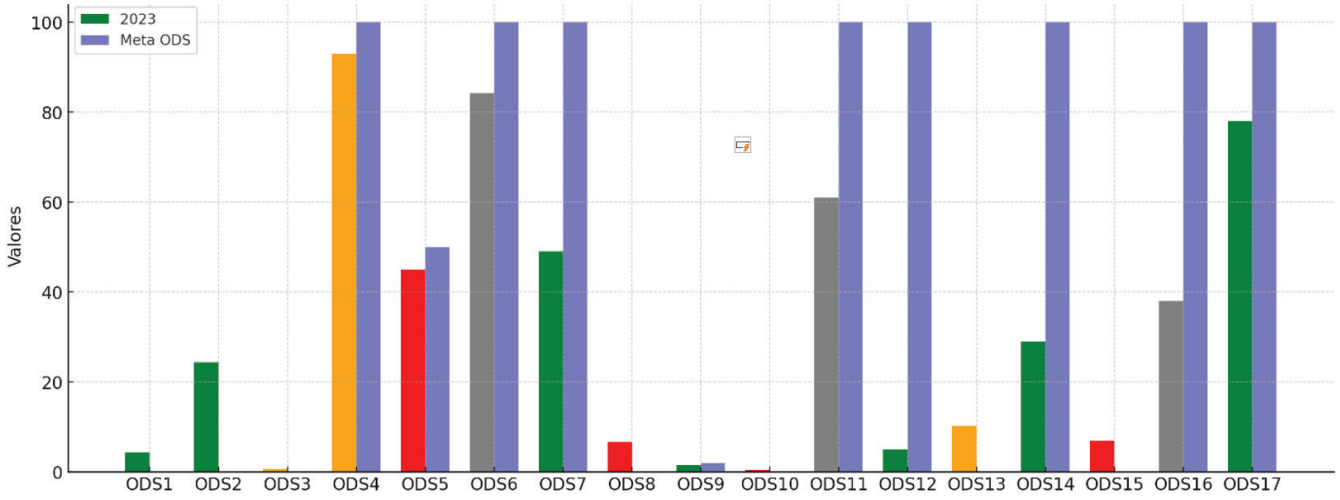

Figure 2. Comparison of the Indicators Selected of the SDGs (2023) with to the Goals

Source: Authors, 2025.

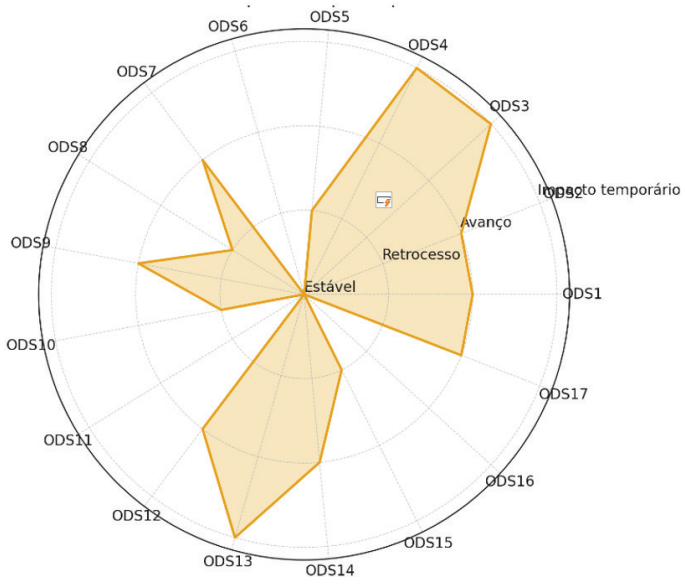

Figure 3. Graphic Radar of Type of Impacts put SDGs

Source: Authors, 2025.

The combined analysis of Figures 2 and 3 shows that the impacts of the Covid-19 pandemic on you indicators of the SDGs node Brazil were multidimensional and heterogeneous, ranging between structural advances, persistent setbacks and conjunctural effects of a nature temporary. The bar graph in Figure 2 demonstrates that, in 2023, indicators associated with the energy matrix (SDG 7), innovation and infrastructure (SDG 9), and institutional partnerships (SDG 17) approached the established targets, showing consistent progress. On the other hand, dimensions social, as equality of gender (SDGs) 5) and reduction of inequalities (SDG 10), as well as environmental goals, such as controlling deforestation (SDG 15), have shown significant setbacks, indicating structural weaknesses that have not yet been overcome.

Already the radar chart, present in the Figure 3, summarizes those The results allowed for the identification of the distribution of impacts among the different objectives: while certain indicators revealed institutional resilience and recovery capacity (SDG 3 and SDG 4), others remained stable at levels below the desired targets (SDG 6, SDG 11, and SDG 16). This representation integrated reinforces the interdependence between to the dimensions social, economic and environmental issues, highlighting that setbacks in distributive and social inclusion variables compromise advances in others areas, demanding, therefore, strategies intersectoral of policies public initiatives to accelerate progress towards the 2030 Agenda.

You results indicate what the pandemic not only was it delayed the progress in various indicators, but also exposed weaknesses structural what require attention immediate. Policies Public policies focused on social protection, employment, and digital inclusion are essential to mitigate setbacks. while investments in energy renewable, search and technological innovation They can generate sustainable progress aligned with the 2030 Agenda.

In synthesis, the analysis critique of the data reinforces the need of one approach integrated and systemic approach to accelerate the implementation of the SDGs in Brazil, considering the setbacks in areas social they can commit advances environmental and economic. THE pandemic It functions, therefore, as a a historical milestone that highlights the urgency of coordinated strategies for to ensure that the country gets back on track towards the goals of the 2030 Agenda.

5 CONCLUSIONS

This study demonstrated that the Covid-19 pandemic represented a watershed moment for monitoring the 2030 Agenda in Brazil, revealing both historical vulnerabilities and opportunities for transformation. The analysis of indicators from 2019 to 2023 showed... what you effects from the crisis sanitary they were multidimensional, reaching of form unequal to the dimensions social, economic and environmental. While some objectives registered While there has been consistent progress, such as increasing the share of renewable sources in the electricity mix (SDG 7), growing investments in research and innovation (SDG 9), and expanding digital connectivity (SDG 17), other areas have suffered persistent setbacks, particularly in the areas of social inclusion and environmental protection, such as women's participation in the labor market. (SDGs) 5), of increase from the inequality of income (SDGs) 10) and from the difficulty of contain deforestation (SDG 15).

You results also evidence what determined impacts they were cyclical, reflecting effects immediate from the pandemic what, in next, they presented recovery, as node This is evident in the case of the Covid-19 mortality rate (SDG 3) and primary school enrollment (SDG 4). This heterogeneity indicates that, although Brazil has demonstrated resilience in some sectors, it remains far from achieving sustainable development patterns in others, which reinforces the need for robust, integrated, and targeted public policies to overcome structural inequalities.

In view of from that, it is concluded what the pandemic no just delayed the reach of goals of the The SDGs, but also tested the country's capacity to articulate coordinated responses to complex crises. For Brazil to get back on track towards the goals of the 2030 Agenda, it is essential to strengthen intersectoral strategies for social inclusion and the promotion of gender equality. generation of

jobs worthy and preservation environmental, aligned to the incentive the technological innovation and international cooperation.

6 ACKNOWLEDGMENTS

The authors express their gratitude to the Foundation for Support of Science and Technology of the State of Pernambuco (FACEPE), and to the Postgraduate Program in Civil and Environmental Engineering (PPGECAM). to the Group of Management Environmental Advanced (GAMA), and to the Center Academic from the Agreste region of UFPE, for all the support and encouragement for the development of the research .

REFERENCES BIBLIOGRAPHICAL

ARPINIA, C. G. et al. A agenda 2030 e a internalização brasileira. J. Hum. Growth Dev., v. 33, n. 3, p. 487–492, 2023. Disponível em: https://revistas.marilia.unesp.br/index.php/jhgd/article/view/13176. Acesso em: 29 set. 2025.

BARBIERI, J. C. Desenvolvimento sustentável: das origens à Agenda 2030. Petrópolis: Vozes, 2020.

BRITO, A. V. C. População e governo: vulnerabilidade à COVID-19 e intervenções públicas no enfrentamento da doença no Ceará. 2022. Disponível em: https://repositorio.ufc.br/handle/riufc/65691. Acesso em: 29 set. 2025.

CEPAL – Comissão Econômica para a América Latina e o Caribe. Panorama social de América Latina 2020. Santiago: CEPAL, 2020. Disponível em: https://digitallibrary.un.org/record/3904115/files/S2000965_en.pdf. Acesso em: 29 set. 2025.

ELIAS, L. Gestão de crises e a pandemia de COVID-19. Nação e Defesa, n. 156, 2020. Disponível em: https://comum.rcaap.pt/handle/10400.26/36562. Acesso em: 29 set. 2025.

FAO – Organização das Nações Unidas para a Alimentação e a Agricultura. Brasil voltou a sair do Mapa da Fome. Roma: FAO, 2025. Disponível em: https://www.fao.org/brasil/noticias/detail-events/en/c/1741586/. Acesso em: 29 set. 2025.

GARCÍA-RODRÍGUEZ, A. et al. Sustainable visions: unsupervised machine learning insights on global development goals. arXiv, 2024. Disponível em: https://arxiv.org/abs/2404.12345. Acesso em: 29 set. 2025.

GONÇALVES, N. C. L. et al. A relação entre os 17 Objetivos de Desenvolvimento Sustentável e a Constituição Federal: uma analogia entre a legislação brasileira e a Agenda 2030. 2024. Disponível em: https://repositorio.unb.br/handle/10482/48048. Acesso em: 29 set. 2025.

GUTERRES, A. Mundo “pode e deve” retornar aos trilhos para alcançar os ODS, defende secretário-geral. Brasília: ONU Brasil, 2021. Disponível em: https://brasil.un.org/pt-br/136025. Acesso em: 29 set. 2025.

IBGE – Instituto Brasileiro de Geografia e Estatística. Síntese de indicadores sociais 2024. Rio de Janeiro: IBGE, 2024. Disponível em: https://www.ibge.gov.br/estatisticas/sociais/populacao/9221. Acesso em: 29 set. 2025.

INSTITUTO DE PESQUISA ECONÔMICA APLICADA (IPEA). ODS – Metas nacionais dos Objetivos de Desenvolvimento Sustentável. Disponível em: https://repositorio.ipea.gov.br/handle/11058/11352. Acesso em: 29 set. 2025.

INTERNATIONAL ENERGY AGENCY (IEA). Global CO_2 emissions rebounded to their highest level in history in 2021. Paris: IEA, 2021. Disponível em: https://www.iea.org/news/global-co2-emissions-rebounded-to-their-highest-level-in-history-in-2021. Acesso em: 29 set. 2025.

OIT – Organização Internacional do Trabalho. COVID-19 e o mundo do trabalho: estimativas de perdas de empregos e horas de trabalho em 2020. Brasília: OIT, 2021. Disponível em: https://agenciabrasil.ebc.com.br/economia/noticia/2021-01/mundo-perdeu-255-milhoes-de-empregos-na-pandemia. Acesso em: 29 set. 2025.

OIT – Organização Internacional do Trabalho. Relatório sobre o impacto da pandemia no mercado de trabalho. Genebra: OIT, 2023. Disponível em: https://www.ilo.org/pt-pt/resource/news/o-relatorio-weso-trends-da-oit-e-o-comportamento-recente-do-mercado-de. Acesso em: 29 set. 2025.

OMS – Organização Mundial da Saúde. Boletim epidemiológico sífilis 2024. Genebra: OMS, 2024. Disponível em: https://cdn.who.int/media/docs/default-source/hq-hiv-hepatitis-and-stis-library/boletim_sifilis_2024_br.pdf. Acesso em: 29 set. 2025.

PNUD – Programa das Nações Unidas para o Desenvolvimento. Diagnóstico situacional de indicadores ODS – Corrente, Piauí. Brasília: PNUD, 2024. Disponível em: https://www.undp.org/sites/g/files/zskgke326/files/2024-12/diagnostico_situacional_corrente.pdf. Acesso em: 29 set. 2025.

PNUD – Programa das Nações Unidas para o Desenvolvimento. Tempos incertos, vidas instáveis: o impacto da COVID-19 no desenvolvimento humano. Brasília: PNUD, 2021. Disponível em: https://www.undp.org/sites/g/files/zskgke326/files/2022-09/hdr2021-22overview-ptpdf.pdf. Acesso em: 29 set. 2025.

PNUMA – Programa das Nações Unidas para o Meio Ambiente. Relatório sobre a lacuna de emissões 2022. Nairobi: PNUMA, 2022. Disponível em: https://www.unep.org/pt-br/resources/relatorio-sobre-lacuna-de-emissoes-2022. Acesso em: 29 set. 2025.

RAASCH, R.; LELIS, R. C. C.; BASSO, V. M. As dimensões e os objetivos de desenvolvimento sustentável após a Agenda 2030: uma revisão sistemática. Revista Brasileira de Gestão Ambiental e Sustentabilidade, v. 10, n. 26, p. 1149–1171, 2023. DOI: https://doi.org/10.21438/rbgas(2023)102626

RODRIGUES, L. H. G. Objetivos do desenvolvimento sustentável: novas perspectivas para o desenvolvimento econômico. Revista Perspectiva, v. 19, n. 3, p. 272–290, 2021. Disponível em: https://periodicos.ufsc.br/index.php/perspectiva/article/view/77347. Acesso em: 29 set. 2025.

SÁ, A. C. N. Indicadores de sustentabilidade para avaliação de programas de coleta seletiva: uma análise crítica. Revista de Estudos Ambientais, v. 12, n. 2, p. 45–67, 2023. DOI: https://doi.org/10.18316/rea.v12i2.9550

SERAFINI, P. G. Os objetivos de desenvolvimento sustentável nas instituições de ensino superior: iniciativas e barreiras no processo de implementação. Dissertação (Mestrado) – Universidade Federal do Rio Grande do Norte, Natal, 2022. Disponível em: https://repositorio.ufrn.br/handle/123456789/51284. Acesso em: 29 set. 2025.

UNESCO. COVID-19 e educação: impactos sobre estudantes e sistemas educacionais. Paris: UNESCO, 2021. Disponível em: https://www.unesco.org/pt/covid-19/education-response. Acesso em: 29 set. 2025.

VENTURA, D. F. L. et al. Desafios da pandemia de COVID-19: por uma agenda brasileira de pesquisa em saúde global e sustentabilidade. Cadernos de Saúde Pública, v. 36, p. e00040620, 2020. DOI: https://doi.org/10.1590/0102-311X00040620

ZORZO, F. B. et al. Desenvolvimento sustentável e Agenda 2030: uma análise dos indicadores brasileiros. Revista Gestão e Desenvolvimento, v. 19, n. 2, p. 160–182, 2022. Disponível em: https://revistas.univates.br/index.php/gestaoedesenvolvimento/article/view/3348. Acesso em: 29 set. 2025.